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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP 03/09224	International filing date (day/month/year) 20.08.2003	Priority date (day/month/year) 04.09.2002
International Patent Classification (IPC) or both national classification and IPC A61K7/06		
Applicant UNILEVER PLC et.al.		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 8 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 4 sheets.

- This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 26.01.2004	Date of completion of this report 09.12.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Schnack, A. Telephone No. +49 89 2399-8149 

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I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17):*

Description, Pages

1-49 as originally filed

Claims, Numbers

1-17 received on 30.11.2004 with letter of 30.11.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

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**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	none
	No: Claims	1-17

Inventive step (IS)	Yes: Claims	none
	No: Claims	1-17

Industrial applicability (IA)	Yes: Claims	1-17
	No: Claims	none

2. Citations and explanations

see separate sheet

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Reference is made to the following documents:

- D1: EP 1 317 917 A (UNILEVER PLC ;UNILEVER NV (NL)) 11 June 2003 (2003-06-11)
- D2: WO 03 047541 A (BAKER MARK EDWARD JAMES ;GILES COLIN CHRISTOPHER DAVID (GB); ARAI) 12 June 2003 (2003-06-12)
- D3: WO 02 087524 A (UNILEVER PLC ;LEVER HINDUSTAN LTD (IN); UNILEVER NV (NL)) 7 November 2002 (2002-11-07)
- D4: EP 0 370 764 A (PROCTER & GAMBLE) 30 May 1990 (1990-05-30)
- D5: US 5 112 603 A (LARYEA JOSEPH M ET AL) 12 May 1992 (1992-05-12)
- D6: MARKLAND W R: "Laponite synthetic clays" CAPLUS, XP002230818
- D7: WO 99 25312 A (HOFMAN HANS ;MELBOUCI MOHAND (NL); DEBRUIN JACOBUS JOHANNES (NL);) 27 May 1999 (1999-05-27)
- D8: US 5 968 491 A (RICHARDSON WENDY VICTORIA JANE) 19 October 1999 (1999-10-19)
- D9: EP 0 726 246 A (RHEOX INT) 14 August 1996 (1996-08-14) cited in the application
- D10: PATENT ABSTRACTS OF JAPAN vol. 018, no. 001 (C-1148), 6 January 1994 (1994-01-06) & JP 05 246824 A (SHISEIDO CO LTD), 24 September 1993 (1993-09-24) cited in the application

Section V

V.1. Novelty

Remarks under Article 33(2) PCT:

D1, D2 and D3 which are all published after the present filing date may become relevant in the subsequent national/regional phase.

The present subject matter according to claim 1 is directed to a hair treatment composition comprising a aqueous dispersion of water-insoluble composite particles, the particles comprising

- i) a charged clay
- ii) a charged organic molecule comprising at least 6 C-atoms
- iii) a water-insoluble hair benefit agent being immiscible with component ii) and being selected from a silicone polymer, a mixture of silicones and finely divided solids and

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wherein I) and ii) have opposite charges and the composition further comprises suitable hair treatment ingredients, and wherein the weight of the composite particles in the composition is from 0.05 to 10 percent by weight of the total weight of the composition.

The present description and the dependent claims further define the constituents making up the insoluble composite particle:

The charged clay component I) can be clay normally used in hair care compositions such as hectorite, smectite etc, (cf. page 6, line 26 - page 9, line 4).

The charged organic molecule ii) can be surfactants usually employed in hair care compositions such as quaternary ammonium compounds, (cf. page 12, line 24 - page 22, line 20).

The present component iii) can be hair care substances which are usually employed in hair care compositions such as silicone polymers, (cf. page 23, lines 21-25).

D1 discloses aqueous hair treatment compositions comprising ingredients falling within the definitions according to I), ii), and iii). Applicant alleges that the hair benefit agent according to D1 is not part of a composite particle as required by present claim 1 and that the present composite particles do not form simply because the components happen to coexist in a particular formulation. Thus, the presently claimed subject matter appears to be novel in view of D1.

Similar arguments are considered applicable in relation to the disclosure in D2.

D3 does not appear to disclose a composite particle comprising the ingredients I), ii) and iii).

D5 explains in col. 5, lines 3-13 that organo-clays, which are marketed under the tradename Bentone, are complexes made from simple monoquaternary ammonium salts possessing one or more fatty alkyl groups on the quaternary nitrogen, and a smectite type clay. D5 goes on to state that such complexes find applications in certain cosmetic formulations. However, D5 fails to explicitly disclose a hair treatment composition comprising such organo-clays. D5 also fails to disclose the present component iii). Thus, novelty can be acknowledged in view of D5.

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D4 discloses a hair care composition comprising a silicone gum having dispersed therein unsolubilized particulate matter, (see D4, page 3, lines 10-14). These compositions may be aqueous dispersions.

D4 also discloses hairspray compositions comprising particles comprising the present components i), ii) and iii), (see D4, page 11, line 32 - page 12, 31 and example VII). Thus, D4 only discloses compositions comprising clays in the context of hairspray compositions. However, these hairspray compositions are not considered to be "aqueous dispersions", since D4 teaches to use a volatile carriers such as ethanol. D4 teaches that "water can also be used to substitute part of the volatile carrier component". However, this statement is not considered to be an explicit and unambiguous disclosure of "an aqueous dispersion" as required by present claim 1. Thus, novelty is acknowledged in view of D4.

D7 teaches a composite particle comprising organophilic clays, (= the complex formed from i) and ii)), and an emollient falling within the present definition of iii). In detail, D7 teaches a fluidized polymer suspension comprising a) a cationic polysaccharide, (corresponds to present ingredient ii)), a stabilizing agent, which can be a clay, (see claim 16), (corresponds to present ingredient i)) and c) an emollient, which can be a silicone oil, (see claim 9), (corresponds to present ingredient iii)). From example 3 of D7 it appears clear that a composite particle of the present type is formed, since the process appears to fall within the presently claimed process for forming the present composite particles, (cf. present claims 12 and 13). The emollient used in example 3 of D7 is mineral, which does not appear to fall within the scope presently claimed "hair benefit agents". However, also the rest of the disclosure of D7 is taken into consideration when assessing novelty, and clearly D7 teaches to use silicone oils as emollients, (see e.g. claim 9). Example 4 and table 2 of D7 teach that the amount of fluidized polymer suspension, which is considered to be equivalent to the presently claimed "aqueous dispersion of composite particles", used falls within the presently claimed range, i.e. 0,05 to 10 percent.

The systems according to D7 must include aqueous dispersions, since clearly shampoos and hair conditioners are aqueous systems, (see D7, page 8, line 4). The fluidized polymer suspensions are intended as a constituent of shampoos and conditioners, and not as the sole ingredient. Thus, it is considered that the fluidized polymer suspensions according to D7, which fall within the present definition of "water insoluble composite particles" is anticipated by D7. Since these suspensions are intended for use in aqueous hair treatment products, it is considered that D7 anticipates

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the presently claimed subject matter. Thus, the present subject matter is not considered novel in view of D7.

D8 discloses aqueous hair treatment compositions comprising a "stabilising-system", said system comprising "modified clays". Modified clays includes the present complex formed from i) and ii), (see D8, col. 7, line 30 - col. 8, line 7). These dispersions additionally comprises cosmetic oils, which would appear, at least to a certain extent, to be incorporated into the modified clays, because the examples I to VII according to D8 are made according to a process, which appears to fall within the presently specified process for making the composite particles, (see D8, col. 11, line 40 - col. 12, line 3). Even though the examples I to VII deal with mineral oil, claim 8 of D8 clearly teaches that also silicone oil is suitable. Even though D8 does not explicitly use the present wording "composite particle", it appears that indeed a composite particle must be formed when carrying out the teaching of D8. Clearly, the compositions according to D8 are aqueous, (see col. 11, lines 12-15).

Thus, it appears that D8 anticipates the novelty of the presently claimed hair treatment composition.

Presently, no clear distinction between the presently claimed subject matter and the teaching of D9 can be acknowledged, because no clear distinction between the present "aqueous dispersions" and the hair cosmetic according to D9 can be seen. The compositions according to D9 appear to include the same ingredients as presently included and the systems according to D9 appear to be largely based on water, (see Table 1, ingredient (7): Deionized water). The meaning of the expression "aqueous dispersion" is considered simply to be a dispersion, which comprises water. Since "dispersion" simply means that two phases are present, one of them being dispersed in the other, it would appear that even the W/O emulsions according to D9, which comprises large amounts of water, could be considered to be "aqueous dispersions".

Claim 19 of D9 teaches a process for making an organoclay (equivalent to the present "composite particle") said process falling within the scope of present claim 13. The diluent used in the process according to claim 19 (equivalent to the present "hair beneficial agent") can be silicones, (see D9, page 5, lines 32-37). The diluent becomes incorporated into the organoclays, (see claim 20). It is thus considered that D9 discloses the present "composite particle".

It is also considered that D9 discloses the remaining technical features of present claim

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1, because D9 teaches the use of the organoclays in hair treatment products of the present type, (see D9, page 4, lines 46-51), and because the remaining features of present claim 1 appear to be technical features, which are inherent in this type of hair treatment compositions.

Thus, also D9 appears to anticipate the novelty of the presently claimed subject matter.

V.2. Inventive step

Remarks under Article 33(3) PCT:

The present concept of employing a complex such as Bentone™ in cosmetic compositions in general and in hair care compositions in particular is known, (see all documents cited in the search report, e.g. D5, D6 and D9). Bentone™ and similar products are inter alia used as thickeners/stabilizers in such preparations together with other ingredients such as defoaming agents, cosmetic oils etc, (e.g. silicone), (see e.g. D8 and D9). The presently alleged "inclusion complex" of the hair beneficial agent, (cf. page 6, lines 10-15), cannot be considered as a novel and inventive feature of the presently claimed subject matter, since such an inclusion complex must have formed also in the prior art hair care compositions employing the same ingredients, (see especially D7, D8 and D9). Also aqueous dispersion systems have employed these "inclusion complexes" before the present priority date, (see novelty objections). Thus, no inventive teaching appears derivable from the present application.

Moreover, since the assessment of inventive step is based upon the difference between the claimed subject matter and the prior art, and since no such difference can be detected, it is not deemed feasible to assess the inventive step of the presently claimed subject matter.

V.3. Industrial applicability

Remarks under Article 33(4) PCT:

The presently claimed subject matter fulfils the requirements of Article 33(4) PCT.

CLAIMS

1. A hair treatment composition comprising an aqueous dispersion of water insoluble composite particles, the
5 particles comprising:

- i) a clay with a net surface charge,
- ii) a charged organic molecule comprising at least 6 carbon atoms, and
- 10 iii) a water insoluble hair benefit agent which is immiscible with the charged organic molecule,

wherein the charge on the charged organic molecule is opposite to the net surface charge of the clay, the hair
15 treatment composition further comprising one or more suitable hair treatment ingredients in a compatible aqueous carrier.

2. A composition as claimed in claim 1, wherein the weight
20 ratio of the charged organic molecule to the clay is from 0.05:1 to 20:1.

3. A composition as claimed in claim 1 or claim 2, wherein the volume based median particle diameter of the composite
25 particles is from 5 to 450 microns.

4. A composition as claimed in any preceding claim, wherein the clay has a net negative surface charge and the charged organic molecule has a positive charge.

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5. A composition as claimed in claim 4, wherein the clay is a synthetic hectorite.

6. A composition as claimed in claim 4 or claim 5, wherein the charged organic molecule is the cation of an alkyl trimethyl ammonium chloride, wherein the alkyl chain comprises from 12 to 22 carbon atoms.

7. A composition as claimed in claim 4 or claim 5, wherein the charged organic molecule is a cationic polymer.

8. A composition as claimed in any preceding claim, wherein the weight ratio of the clay to the water insoluble hair benefit agent is from 0.05:1 to 1:1.

9. A composition as claimed in any preceding claim, wherein the water insoluble hair benefit agent is a silicone polymer.

10. A composition as claimed in claim 9, wherein the silicone polymer is a silicone elastomer.

11. A composition as claimed in any preceding claim, wherein the weight of water insoluble composite particles, based on the total composition, is from 0.01 to 20 percent by weight of the total composition.

12. A composition as claimed in any preceding claim, which is a rinse off hair conditioner.

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13. A process for the preparation of an aqueous dispersion of composite particles as defined in any one of claims 1 to 11, comprising the steps of:

- (i) dispersing the water insoluble hair benefit agent and the clay in water to form a dispersed premixture of clay and hair benefit agent,
- (ii) combining the premixture with the charged organic molecule.

14. A process for the preparation of an aqueous dispersion of composite particles as defined in any one of claims 1 to 11, comprising the steps of:

- (i) dispersing the water insoluble hair benefit agent and the charged organic molecule in water to form a dispersed premixture of charged organic molecule and hair benefit agent,
- (ii) combining the premixture with the clay.

15. A process for making a hair treatment composition according to any of claims 1 to 11 comprising the steps of:

- (i) preparing an aqueous dispersion of composite particles by the process of claim 13 or claim 14, and
- (ii) combining the aqueous dispersion of composite particles with the remaining suitable hair treatment ingredients in a compatible aqueous carrier without first drying the aqueous dispersion of composite particles.

16. A method for treating hair and/or scalp, which comprises applying to the hair and/or scalp a composition as

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claimed in any one of claims 1 to 12 followed by rinsing with water.

5 18. A method for depositing hair benefit agents onto hair and/or scalp, which comprises applying to the hair and/or scalp a composition as claimed in any one of claims 1 to 12 followed by rinsing with water.

10 19. Use of a hair treatment composition as claimed in any one of claims 1 to 12 to deposit hair benefit agents onto hair and/or scalp.